



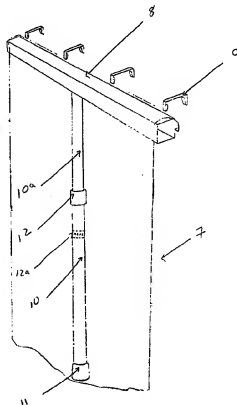
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(54) Title: INDOOR BARRIER DEVICE ASSEMBLY

(57) Abstract

A T-frame barrier device for indoor use to provide a protective shield against dust or against any other incursion of foreign particles. The present invention comprises a horizontal structure (8) attached to an adjustable pole (10) to form a T-frame support structure with the ability to secure a sheet material (7) over the horizontal attachment to act as a barrier. It has an adjustable pole (10a) for supporting an adjustable horizontal structure comprised of a main member (8) and two other members (1, 2) that form sleeves in which the main member is slidably mounted. Alternatively, one of the two horizontal sleeves (1, 2) can be used alone to form a horizontal structure. All of the components of the said device are fabricated so they can be stored within a housing formed by the two sleeves.



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INDOOR BARRIER DEVICE ASSEMBLY

BACKGROUND OF THE INVENTION

1. FIELD OF THE INVENTION

This invention relates to an apparatus for closing off openings, doorways, entrances, areas, etc., with sheet plastic or other barrier materials to prevent the influx of dust particles, spray paint or any other undesirable foreign particles. By adjusting the invention to a desired length and/or width, any section of a room or particular area can be readily and easily partitioned without damage to the adjoining ceiling, wall or fixture, (i.e. plaster, paint, molding or wallpaper), while in the meantime still permitting access to and from the area that is being partitioned.

This invention also relates to a handy apparatus whereby all components are stored within one of the components, making this invention lightweight and easy to assemble and disassemble. Because all components are stored within one component, the invention can be easily stored and occupies a minimum amount of space in a closet, vehicle, etc. The present invention can be reused for openings or areas of various sizes by adjusting the width of the horizontal attachment and the height of the vertical pole to form a T-frame suitable for the particular dimensions of any opening or area. The present invention when assembled extends to approximately eight feet wide and nine feet high, although larger T-frame devices can be manufactured. This invention can be adjusted to various sizes for use in different size openings, areas, etc. This T-Frame is used to support a

plastic sheet material or any other suitable barrier material available by positioning the material over the horizontal attachment to form a barrier against the incursion of unwanted particles.

This invention can be used in numerous ways by construction companies, painters, auto-body shops, tool rental stores, architects, interior decorators, photographers, do-it-yourselfers, etc.

2. DESCRIPTION OF RELATED ART

Barrier devices comprising a pole and fabric body assembly are well known. In fact, windshield barriers are very well known in the art. U.S. Patent No. 4,838,525, issued on June 13, 1989, relates to an outdoor structure that shields the users from the wind. In this invention, a plurality of panels and supports are used to form a composite shield. Spikes are secured in the ground and connected to the panels to provide stability. The panels can be folded to facilitate transportation. Similarly, U.S. Patent No. 4,966,181 issued on October 30, 1990 discloses a beach wind shielding and signalling device having three support poles. A rectangularly shaped fabric material is vertically supported on the poles so that users on the leeward side are shielded from the wind. The fabric material has color indicia or the like imprinted on the windward side to serve as a location-indicating visual signal.

The conventional method currently used to close off openings, doorways, entrances, etc. against foreign particles, (i.e., dust, spray paint, etc.), consists of fastening or taping a barrier material to a supporting ceiling, wall, or

fixture. This is a burdensome task as it requires measuring the barrier material to a desired length and manually taping or fastening it around the perimeter of the opening, doorway, entrance, etc. This taping or fastening process temporarily blocks the access of the entrance way. Furthermore, once the erected barrier is finished, the unwanted task of removing the barrier material fastened or taped to the support structures is required. It is known that frames with an overlapping sheet material attached to the frame have been designed to act as a barrier to close off an opening. However, these barriers require exact measurements for the particular openings and the burdensome and time consuming task of assembling the structure. Furthermore, such custom-made barrier frames are costly, bulky to store and cannot be reused for openings or areas having different dimensions.

The present invention is a novel solution to the problem of closing off openings, doorways, entrances, sections of rooms or any other desired area by the use of an adjustable T-frame structure that supports the barrier material. The user drapes and secures a barrier sheet material over the horizontal member and adjusts the vertical member so that the horizontal member, is securely pressed against the ceiling and the barrier sheet material is held in place. For closing off openings, doorways, entrances, etc., the user adjusts the width of the horizontal member allowing for a generous overlap of the walls on both sides of said opening. The user cuts or folds the barrier sheet material to the desired width of the horizontal member and to a height one foot higher than the room ceiling. After having secured the barrier sheet material to the horizontal

member, and the horizontal member to the vertical member, the user adjusts the vertical member so that the horizontal member is securely pressed to the junction at the top of the wall above the opening and the ceiling, allowing for a generous overlap of the barrier sheet material, on both sides of the opening, as well as the floor. The user, by hand, smooths the overlap of barrier sheet material along the wall, on both sides of the opening, to the floor. The user places a folded rag or old towel at the corners, where the overlap of the wall and floor meet. Removing the towel, allows the user easy access through the opening. By using one or more 'DUST-T' indoor barrier device assemblies, any section of a room or area can be partitioned off. Common spring clothespins are used to keep the seams of the individual sheets of barrier sheet material closed, as well as for allowing easy access. The barrier thus formed isolates the protected area against the influx of unwanted particles, while not limiting the access to and from the area. The present invention is reusable and has the capability of storing each component within one of the components and is lightweight, easy to assemble, easy to use and easy to store. This invention has not been taught or suggested by the prior art.

SUMMARY OF THE INVENTION

An object of the present invention is to provide an adjustable barrier device for quickly and easily sealing off an indoor area from the incursion of foreign particles while not limiting access by the user. Prior art devices have not been satisfactory because they take too long to install, they cannot

be conveniently stored, they are not easy to disassemble and they are heavy and bulky. Furthermore, the prior art devices when assembled temporarily block the access to and from the area being closed off because of the taping or fastening of the barrier material to the perimeter of the opening. The present invention provides a barrier that closes off a doorway, opening, area, etc., while still allowing the user to easily move the barrier sheet material for access through the doorway, opening, area, etc.

A principal object of the present invention is to provide an indoor barrier assembly that is lightweight, easily installed, adjustable to various widths and heights and allows convenient passage through the barrier by displacing the sheet material.

The present invention provides an indoor barrier device for closing and partitioning areas from foreign particles comprising

a) an adjustable horizontal structure having at least one main member with movable horizontal extension sleeves, the main member having top and bottom surfaces and sidewalls, the bottom surface having at least one cut-out opening, the sidewalls having a plurality of tab holes on either side of the sidewalls, the sleeves have top and bottom surfaces and sidewalls, the sidewalls of the first sleeve having at least one tab hole on either side of the sidewalls, and the sidewalls of the second sleeve having a plurality of tab holes on either side of the sidewalls, the bottom surface of the second sleeve having at least one cut-out opening; b) an adjustable vertical pole having at least one opening at one end of the pole; c)

means for adjusting the pole; d) at least one plug for securing the horizontal structure to the pole and securing the components during storage e) means for securing pole to plug; f) a protective means for covering one end of the pole; g) at least one sheet material secured to the horizontal structure to form a barrier; h) means for securing the sheet material to the horizontal structure; i) means for securing main member to sleeves during storage.

A further object of the present invention is to provide a single housing for the components of the invention to facilitate transportation and storage. This is accomplished through the use of custom threaded plugs which are used as end plugs to secure the components within the extension sleeves. In addition, these plugs are used to secure the vertical pole by the threaded means located at one end of the pole to the horizontal main member, or said second sleeve.

Another object of the present invention is to provide fast and convenient attachment of the barrier sheet material to the T-frame. This is accomplished by the use of custom stainless steel clips or by any other non-damaging fastening means to secure the sheet material to the horizontal structure.

Another principle object of the present invention is the fast and easy system of assembling the barrier device. This is accomplished by constructing the invention from the components, wherein the clips are stored within the vertical pole, the pole is stored within the horizontal main member, and the main member is stored within the horizontal extension sleeves. All components of the present invention are secured within the housing formed by the extension sleeves by the threaded plugs,

which are affixed to the opposing ends.

BRIEF DESCRIPTION OF DRAWINGS

Other objectives, features and embodiments of the present invention are described herein and will also be apparent from the following detailed description of the invention, taken in conjunction with the accompanying drawings, wherein:

FIG. 1 shows a top view of a disassembled barrier device with all components stored within the device.

FIG. 2 shows a partial perspective view of an assembled barrier device displaying clips used to secure the barrier sheet material.

FIG. 3 shows a partial perspective view of an assembled barrier device displaying clips and the suspended barrier sheet material.

FIG. 4 shows a partial perspective view of an assembled barrier device displaying the barrier sheet material secured by the clips.

FIG. 5A shows a perspective view of the main member bar with at least one opening on the bottom surface, and with the location of the single connector spring tab.

FIG. 5B shows a perspective view of the first extension sleeve within which the main member bar can be inserted.

FIG. 5C shows a perspective view of the second extension sleeve, with at least one opening on the bottom surface, within which the main member can be inserted.

FIG. 6A shows a cross-sectional view of each component of the threaded plug.

FIG. 6B shows a cross-sectional view of a fully assembled threaded plug.

FIG. 7A shows a side view of a pop rivet and a washer of the threaded plug.

FIG. 7B shows a top and bottom view of the strength cap of the threaded plug.

FIG. 7C shows a cross-sectional view of a fully assembled threaded plug.

FIG. 7D shows side views of the strength cap used in the threaded plug.

FIG. 8A shows a top and bottom view of double sheet metal spring tabs used in the threaded plugs.

FIG. 8B shows a cross-sectional view of the threaded plug in place within the horizontal main member.

FIG. 8C shows a side view of double sheet metal spring tabs for threaded plugs.

FIG. 8D shows a cross-sectional view of the threaded plug stored within the second sleeve.

FIG. 9A shows a top view of the threaded plug housing.

FIG. 9B shows a bottom view of the threaded plug housing.

FIG. 9C shows a side view of the threaded plug housing.

FIG. 9D shows a side view of the threaded plug housing.

FIG. 10A shows a top and bottom view of stainless steel clips.

FIG. 10B shows a top and bottom view of the sheet metal single connector spring tab located within the horizontal main member.

FIG. 10C shows a side view of the stainless steel clips.

FIG. 10D shows side view of the sheet metal single connector spring tab located within the main member.

FIG. 11 shows a cross-sectional view of the threaded plug

securing the horizontal main member bar to the adjustable vertical pole.

FIG. 12A shows a side cross-sectional view of the disassembled present invention with a plug, single connector spring tab, adjustable means, pole and main member and sleeves stored within each other.

FIG. 12B shows a side cross-sectional view of the disassembled present invention with the clips, protective cap, plug, pole and main member and sleeves stored within each other.

DETAILED DESCRIPTION OF THE INVENTION

As shown in the accompanying drawings, the present invention provides an indoor barrier device that prevents the incursion of unwanted particles through an opening or area. Fig. 1 shows the invention disassembled with the components as described herein stored within the housing formed by the extension sleeves [1, 2]. The components of the invention are stored within the extension sleeves [1, 2] and the ends are sealed by threaded plugs [5, 6] which contain spring tabs [3, 4] that are snapped into place at the opposite ends of the sleeves [1, 2] by means of the tab holes located on the sidewalls of the extension sleeves and main member. Spring tab [3a] is placed within the end opening of the main member and is used to fasten the second sleeve [2] to the main member [not shown] during storage. The threaded plug [5] of the second sleeve [2] is larger than the custom threaded plug [6] used as an end plug of the first sleeve [1]. In addition, the second sleeve [2] is greater in length than the first sleeve [1],

allowing the user the option of forming horizontal structures of varying lengths. When the present invention is assembled as shown in Fig. 2, the barrier device becomes an adjustable T-frame supporting device, particularly advantageous for indoor use, for shielding doorways, openings, entrances, or portions of a room from unwanted particles such as dust, sawdust, paint and vapor. The T-frame device consists of an adjustable horizontal structure comprising a main member [8] with movable horizontal extension sleeves [1, 2], attached to a vertical pole [10] with an adjustable vertical length [10a] with threaded end [10c] as shown in Fig. 11 secured by an adjustable means [12a].

The vertical pole having two opposing ends, the first opposing end is covered by a protective means, (i.e., a rubber end cap) [11] and the second threaded opposing end [10c] as shown in Fig. 11. The extension length [10a] is secured by an adjustable means [12a]. The extension length [10a] is secured to the horizontal structure by means of a threaded plug (not shown).

In Fig. 2, a plurality of clips [9] used to secure the barrier sheet material are shown. When the invention is disassembled, the user removes the rubber cap [11] and the clips [9] and they are stored within the vertical pole [10]. A plastic end fitting [12] is attached to one end of the vertical pole [10], through which, the adjustable vertical length [10a] passes. Fig. 3 shows the placement of a barrier sheet material [7] of a desired width and length over the horizontal structure. The sheet material can be comprised of a cloth, plastic or preferably polypropylene composition. The sheet

material [7] as shown in Fig. 4 is secured to the horizontal structure by a plurality of clips [9].

The horizontal structure as shown in Figs. 5A-5C comprises a main member [8] as shown in Fig. 5A with a slidably mounted first extension sleeve [1] as shown in Fig. 5B and a slidably mounted second extension sleeve [2] as shown in Fig. 5C. In Fig. 5A, the main member [8] of the horizontal structure contains at least one opening [13] on the bottom surface for insertion of the threaded plug (not shown) secured by means of the tab holes [17]. The threaded plug is adopted to accept the threaded end [10c] of the adjustable vertical length [10a] as shown in Fig. 11. The tab hole [14b] of the main member [8] is used to insert the spring tab [14a] of the single connector spring tab [14] for securing the main member [8] to the second extension sleeve [2]. As shown in Fig. 5B, the tab holes [15] of the first extension sleeve [1] and tab holes [27] of the main member [8], as shown in Fig. 5A, are used to secure the threaded plug (not shown) to the main member [8] and first extension sleeve [1] during storage. The threaded plug acts then as an end plug during storage. When the invention is assembled, the plug is removed and the first extension sleeve [1] is slidably mounted on the main member [8]. The spring tab hole [16] of the second extension sleeve [2] of Fig. 5C is similar to the spring tab hole [14b] of the main member [8] and it is used for securing the second sleeve [2] to the main member [8] by means of the single connector spring tab [14]. When spring tab [14a] is depressed, the second extension sleeve is slidably mounted on the main member.

In Fig. 5A an opening [13] is located on the bottom

surface of the main member [8] with tab holes [17] located on each of the adjoining sidewalls for securing an adaption means for connecting the vertical pole (not shown), preferably by means of the smaller threaded plug (not shown). Similarly in Fig. 5C, an opening [18] is located on the bottom surface of the second extension sleeve [2] with tab holes [19] located on each of the adjoining sidewalls for securing an adaption means for connecting the vertical pole (not shown), preferably by means of the larger threaded plug (not shown). This enables the user to attach either the horizontal main member [8] to the vertical pole by means of a threaded plug mounted in the opening [13] for large openings or areas, or the second extension sleeve [2] to the vertical pole by means of a second larger threaded plug mounted in the opening [18] for smaller openings. As shown in Fig. 5C, the tab holes [20] located at one end of the second longer extension sleeve [2] are used for securing the second larger threaded plug (not shown) during storage of the present invention.

The threaded plugs described above are shown in Fig. 6A and 6B, which details the components of the threaded plugs used to secure the vertical pole to either the main member [8] shown in Fig. 5A or the second sleeve [2] shown in Fig. 5C. The plugs are also used as end plugs, and to secure the first sleeve [1] to the main member [8] during storage. The threaded plug [26] as shown assembled in Fig. 6B should be preferably made of molded plastic and comprise a pop rivet [21] which secures a plastic strength cap [22] to a double spring tab [23] mounted on a molded plastic housing [24] and secured by a washer [25]. The tabs [23a] of the double spring tab [23]

are snapped into the tab holes on the main member [8] and extension sleeves [1] and [2] shown in Figs. 5A-5C. Figs. 7A, 7B, 7D show different views of three components comprising the threaded plug and Fig. 7C shows an assembled plug. The pop rivet [21] is used to penetrate the strength cap [22], through the double spring tab [23], into the housing [24] and secured by a washer [25]. Fig. 8A shows a top and bottom view of the double spring tab [23] for custom plugs. The important feature of the plug is the double spring tab [23] which is designed to snap into the horizontal structure by means of the tab holes. In Fig. 8B, the threaded plug [26] is moved to the opening [13] and tabs [23a] of the double spring tab [23] are snapped into the tab holes [17] located on the side walls of the main member [8] and secured by the threaded means of the plug [10b] to threaded means [10c] of the vertical pole. Fig. 8C shows a side view of the double sheet metal spring tabs. Fig. 8D shows the custom plug [26] stored as an end plug at one end of the opening of the second sleeve [2]. The plug, by its double spring tab [23] is secured to the end by snapping the tabs [23a] into the tab holes [20]. The threaded plugs serve as end plugs to close off the openings of the sleeves after the components are stored.

Fig. 9A - 9D shows different views of the threaded plug housing. The housing [24] of the plug is comprised of molded plastic or any other suitable material.

Fig. 10A and 10C shows the different views of the clips [9] used to fasten the sheet material to the horizontal member. The clips comprised of stainless steel or any other suitable means are sized to fit within the hollow vertical pole during

storage. In Figs. 10B and 10D, views of the single connector spring tab [14] are shown with the tab [14a] protruding, this tab is inserted into the tab hole [14b] of the main member [8] and the tab hole [16] of the second longer sleeve [2] for securing the two horizontal structures. In FIG. 11, the T-frame barrier device is fully assembled with the main member [8] mounted to the adjustable pole by the custom plug [26] by threaded means. The spring tabs [23a] of the custom plug shown in Fig. 6A protrude from the tab holes [17] of the main member [8]. The horizontal structure is adjustable to any desired width, the maximum width is approximately eight feet but the invention also includes embodiments wider than eight feet. Optionally, the user can install the second extension sleeve [2] without the use of the main member [8] for use in shielding doorways, hallways, stairs, etc., or other openings, the total width is approximately three feet. FIG. 12A and 12B display the dissembled invention with all components stored within the sleeves [1,2]. The extension sleeves [1,2] totally encapsulate the horizontal main member [8]. The first shorter sleeve [1] locks into the main member [8] as shown in Fig. 12B at one end by aligning the tab holes [27, 15] as shown in Fig. 5A and 5B and inserting in the spring tabs [23a] of the smaller threaded plug [26]. The second longer sleeve [2] locks into the main member [8] as shown in Fig. 12A by aligning the single tab holes [14b, 16] and inserting tab [14a] on the single connector spring tab [14] shown in Fig. 5A and 5C. The vertical pole is adjusted to its minimum length by the adjustable means [12a] and stored within the main member with the mounting means [10c] facing the larger threaded plug of the second sleeve. Fig. 12B

shows a plurality of clips [9] stored within the vertical pole [10] secured by the rubber end cap [11].

For assembling the present invention to close off openings, doorways, entrances, areas, etc. against unwanted particles, the spring tabs [23] of the threaded plug [26] are depressed and the plug is removed. The vertical pole is removed from the main member [8]. The protective covering [11] is removed from the end of the vertical pole [10] and the clips [9] are removed. The pole [10] with adjustable length [10a] is adjusted to a desired height by the adjustable means [12a]. For assembly, the threaded plug [26] is secured by the spring tabs [23a] into the cut-out openings [13, 18] of the main member [8] or the second sleeve [2] by snapping into the tab holes [17, 19] for acceptance of the securing means [10c] at the end of the adjustable length [10a] of the pole [10]. The vertical pole is adjustable to any desired length, the maximum length is approximately nine feet, but the invention also includes embodiments longer than nine feet. The user can extend the length of the horizontal structure by moving the second and first sleeves [1, 2] to the desired width.

The sleeves [1, 2] are extended allowing for a generous overlap of the walls on either side of the opening or area to be partitioned or for partitioning any section of a room or area. The sheet material [7] is cut or folded to a desired width and height to act as a shield to prevent the in- flux of particles. The material is attached to the horizontal member [8] and/or sleeves [1,2] with the clips [9] or any other non-damaging suitable securing means, (i.e., fasteners, tape, hooks, etc).

As described, the present invention is an easy to assemble barrier device, which components are inter-locking. The barrier device isolates a particular area from the spread of unwanted particles, while still providing the user with an access to and from the area. The device is easily disassembled with no damage to the surrounding environment and is easily stored. The present invention allows the user to reuse the barrier device continuously. The invention can be widely used by construction firms, painting firms, auto-body shops, do-it-yourselfers, tool rental stores, interior decorators, architects, photographers, etc.

Having thus described in detail the preferred embodiment of the present invention, it is to be understood that the invention defined by the appended claims is not to be limited by particular details set forth in the above description as many apparent variations thereof are possible without departing from the spirit or scope of the present invention.

CLAIMS

1. A T-frame indoor barrier device for closing and partitioning areas comprising

- a) an adjustable horizontal structure having at least one main member with movable horizontal extension sleeves, the main member having top and bottom surfaces and sidewalls, the bottom surface having at least one cut-out opening, the sidewalls having a plurality of tab holes on either side of the sidewalls;
- b) an adjustable vertical pole having at least one opening at one end of the pole and having a threaded means at the opposite end of the pole;
- c) means for adjusting the pole;
- d) means for securing the horizontal structure to the pole and for securing the main member to one of the sleeves;
- e) means for securing the main member to one of the sleeves;
- f) a protective means for covering one end of the pole;
- g) at least one sheet material secured to the horizontal structure to form a barrier;
- h) means for securing the sheet material to the horizontal structure.

2. A barrier device claimed in claim 1, wherein the sleeves have a top and bottom surfaces and sidewalls.

3. A barrier device claimed in claim 2, wherein the sidewalls of the first sleeve having at least one tab hole on either side of the sidewalls, and the sidewalls of the second sleeve having a plurality of tab holes on either side of the sidewalls, the bottom surface of the second sleeve having at least one cut-out opening.

4. A barrier device claimed in claim 3, wherein the second sleeve is greater in length than the first one.

5. A barrier device claimed in claim 4, wherein the second

sleeve is preferably three feet in length.

6. A barrier device claimed in claim 1, wherein the sleeves are sized to fit and slide over the main member.

7. A barrier device claimed in claim 1, wherein the protective means for covering one end of the pole is a rubber cap.

8. A barrier device claimed in claim 1, wherein the means for securing the sleeves to the main member is a threaded plug and a single connector spring tab.

9. A barrier device claimed in claim 8, wherein the single connector spring tab is comprised of sheet metal.

10. A barrier device claimed in claim 1, wherein the means for securing the horizontal structure to the pole is a threaded plug.

11. A barrier device claimed in claim 1, wherein the means for securing the sheet material are clips comprised of stainless steel.

12. A T-frame indoor barrier device constructed for easy storage and assembly comprising:

- a) an adjustable vertical pole adjusted to minimum height which is stored within a horizontal main member;
- b) a plurality of clips capable of being stored within the pole secured by a rubber cap;
- c) two horizontal sleeves having opposing ends that form a housing for storing the horizontal main member;
- d) means for closing off the ends of the sleeves;
- e) means for securing the horizontal main member to the sleeves during storage.

13. The device claimed in claim 12, wherein threaded plugs are used as the means for closing off the ends of the sleeves.

14. The device claimed in claim 12, wherein the means for securing the horizontal main member to the sleeves during storage is a single connector spring tab and a threaded plug.

15. The threaded plug, wherein the plug comprises:

- a) a pop rivet;
- b) a strength cap having an opening adapted to accept the pop rivet;
- c) a double spring tab designed to snap into the horizontal structure by means of sized tab holes;
- d) a housing having a top and bottom opening wherein the top opening is adapted to accept the pop rivet for securing strength cap and double spring tab to said housing;
- e) means for connecting the plug to the pole;
- f) a washer for securing the pop rivet to the housing.

16. The plug claimed in claim 15, wherein the pop rivet is for securing a strength cap to a double spring tab mounted on a housing and secured by a washer.

17. The plug claimed in claim 15, wherein the double spring tab has a top length and a plurality of side lengths with protruding tabs at the end of the side lengths, the top length having an opening adapted to accept the pop rivet.

18. The plug claimed in claim 15, wherein the housing and strength cap are comprised of plastic.

19. The plug claimed in claim 15, wherein the means for connecting the plug to the pole is threaded and located within the housing.

20. The plug claimed in claim 15, wherein the double spring tab is comprised of sheet metal.

FIG. 1

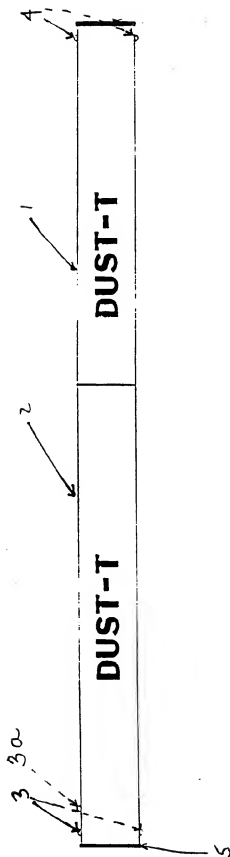


Fig. 2

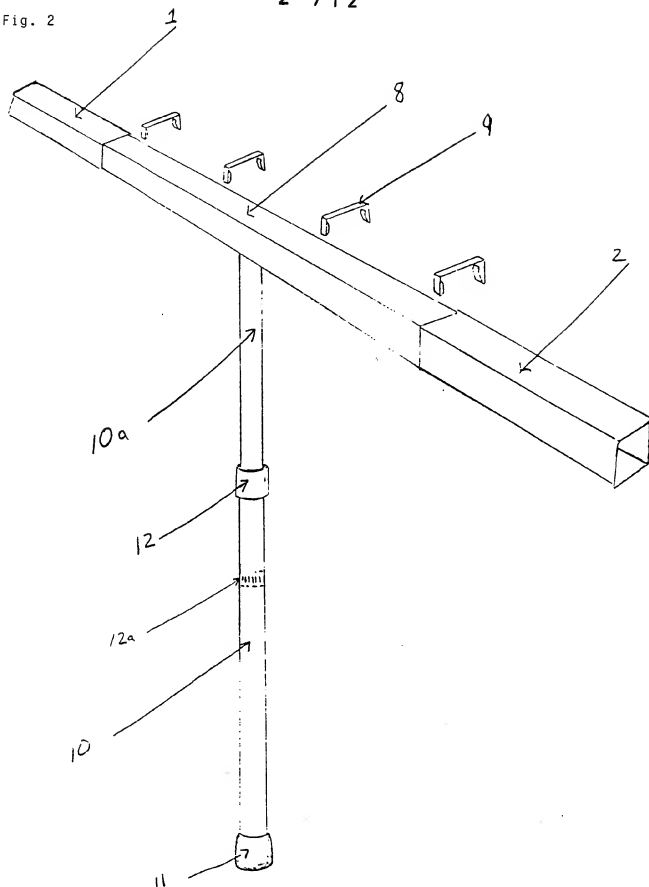


Fig. 3

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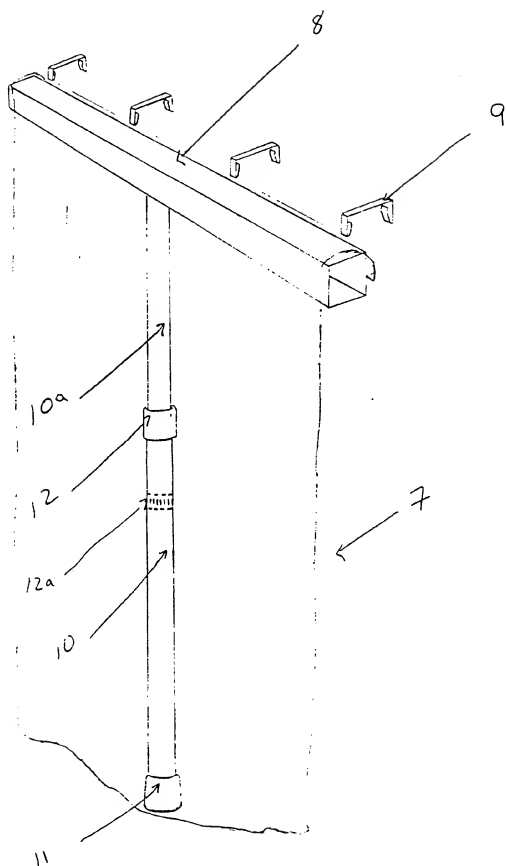


Fig. 4

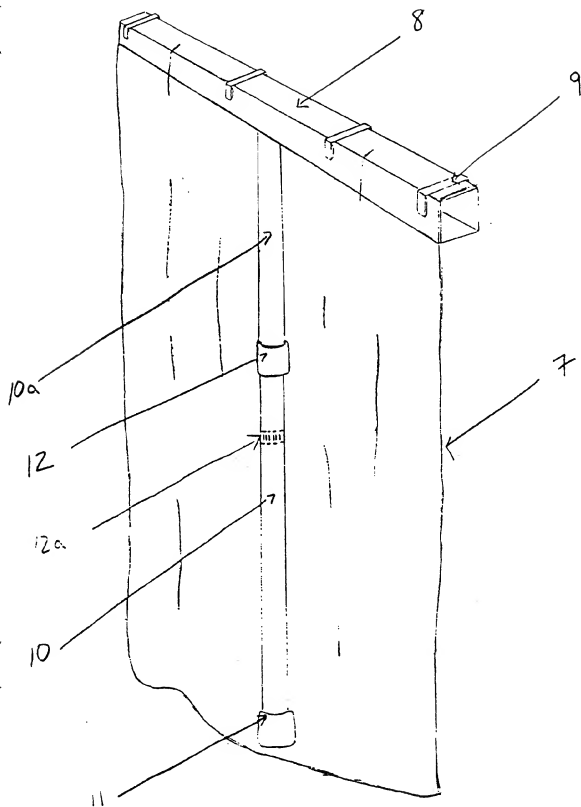
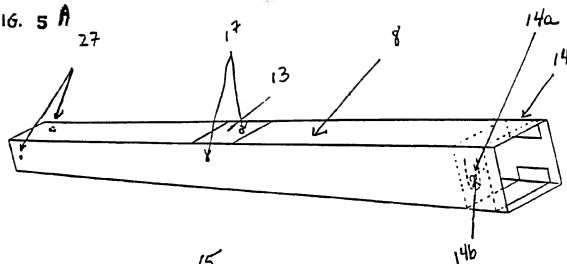
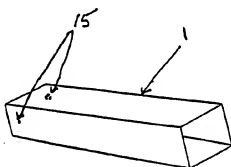


FIG. 5 A



5 B



5 C

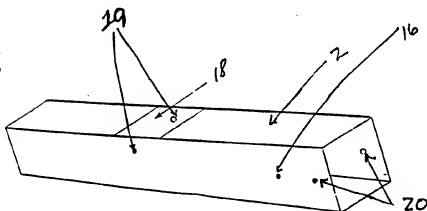
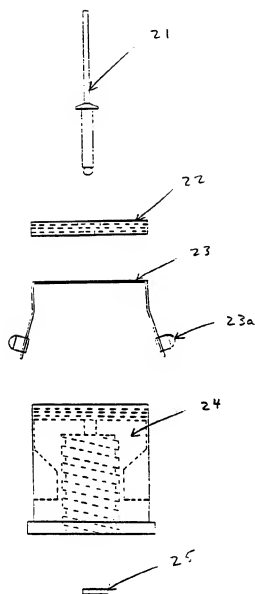


FIG. 6A



6B

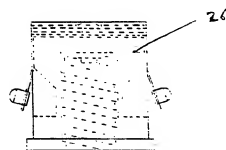


Fig. 7

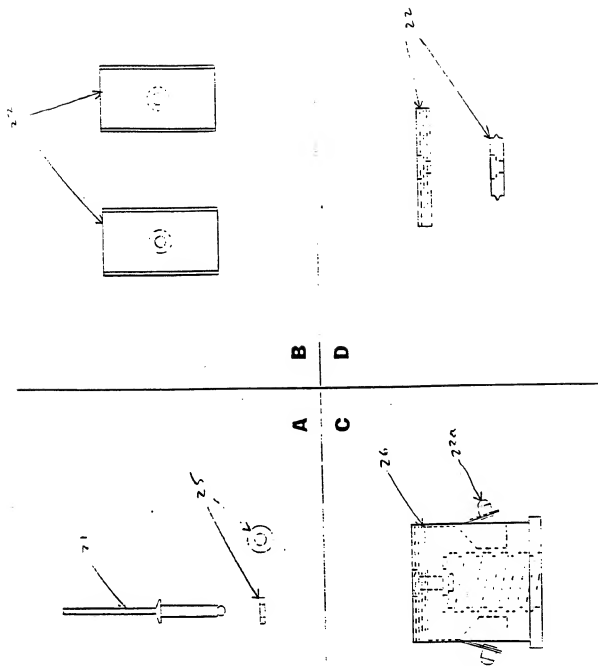


FIG. 8

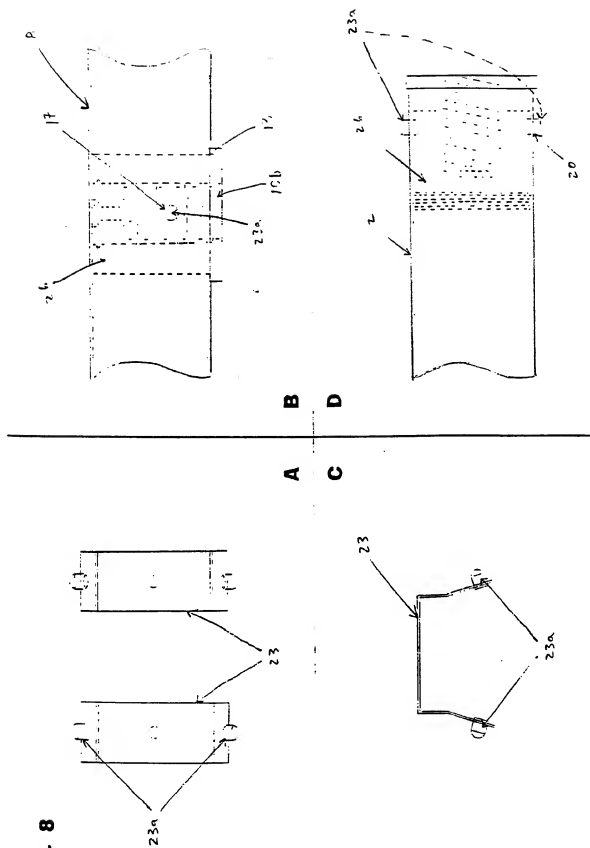
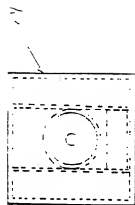
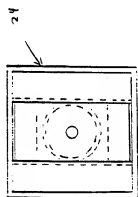
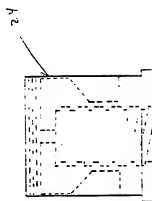
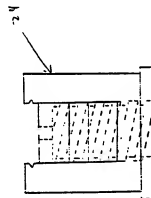


FIG 9



A B
C D



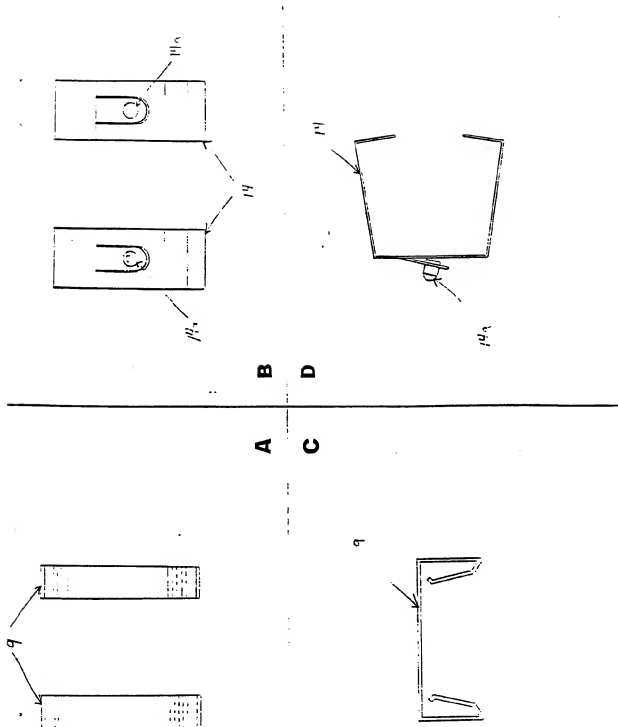
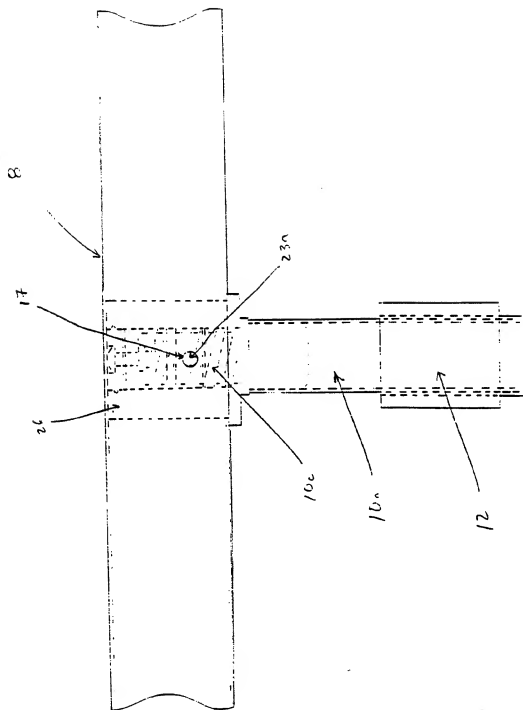
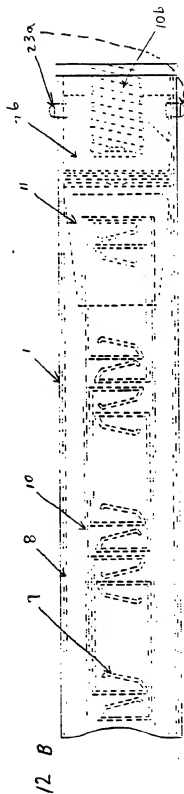
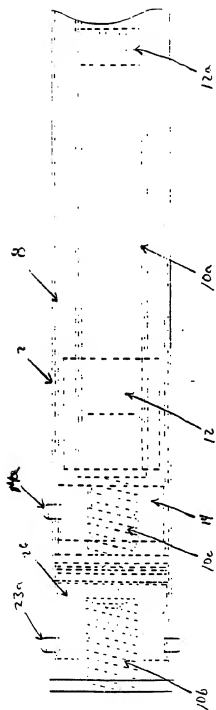


FIG. 11





INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/06014**A. CLASSIFICATION OF SUBJECT MATTER**

IPC(5) : A47H 1/00; A47G 5/00

US CL : 160/330,350;248/460;403/108; 52/239; 411/182

According to International Patent Classification (IPC) or to both national classification and IPC

B. FIELDS SEARCHED

Minimum documentation searched (classification system followed by classification symbols)

U.S. : 160/330,350;248/460;403/108; 52/239; 411/182

Documentation searched other than minimum documentation to the extent that such documents are included in the fields searched

Electronic data base consulted during the international search (name of data base and, where practicable, search terms used)

C. DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 4,794,974 (MELINO), 03 JANUARY 1989. SEE ENTIRE DOCUMENT.	1-7
Y	US, A, 4,708,189 (WARD) 24 NOVEMBER 1987. SEE ENTIRE DOCUMENT.	1-7
Y	US, A, 4,577,837 (BERG ET AL.) 25 MARCH 1986. SEE FIGS, 2A AND 3.	3, 9
Y	US, A, 3,074,740 (ZASTROW), 22 JANUARY 1963. SEE ENTIRE DOCUMENT.	1-5
Y	US, A, 2,245,705 (NORRIS) 17 JUNE 1941. SEE ENTIRE DOCUMENT.	1, 11
Y	US, A, 987,884 (JELLISON) 28 MARCH 1911. SEE ENTIRE DOCUMENT.	1-7

☒ Further documents are listed in the continuation of Box C.
 ☐ See patent family annex.

* Special categories of cited documents:	*T	later documents published after the international filing date or priority date and not in conflict with the application but cited to understand the principle or theory underlying the invention
A document defining the general state of the art which is not considered to be of particular relevance	*X*	document of particular relevance; the claimed invention cannot be considered novel or cannot be considered to involve an inventive step when the document is taken alone
E earlier document published on or after the international filing date	*Y*	document of particular relevance; the claimed invention cannot be considered to involve an inventive step when the document is combined with one or more other such documents, such combination being obvious to a person skilled in the art
L document which may throw doubts on priority claim(s) or which is cited to establish the publication date of another citation or other special reason (as specified)	*A*	document member of the same patent family
O document referring to an oral disclosure, use, exhibition or other means		
P document published prior to the international filing date but later than the priority date claimed		

Date of the actual completion of the international search 19 AUGUST 1994	Date of mailing of the international search report SEP 06 1994
Name and mailing address of the ISA/US Commissioner of Patents and Trademarks Box PCT Washington, D.C. 20231 Facsimile No. (703) 305-3230	Authorized officer WINNIE YIP <i>Winnie Yip</i> Telephone No. (703) 308-2168

INTERNATIONAL SEARCH REPORT

International application No.
PCT/US94/06014

C (Continuation). DOCUMENTS CONSIDERED TO BE RELEVANT

Category*	Citation of document, with indication, where appropriate, of the relevant passages	Relevant to claim No.
Y	US, A, 865,520 (PAGE) 10 SEPTEMBER 1907. SEE FIGS. 1-4.	11
Y	US, A, 4,606,688 (MORAN ET AL.) 19 AUGUST 1986. SEE ENTIRE DOCUMENT.	15-20
Y	GB, A, 303,988 (WILKINSON) 17 JANUARY, 1929. SEE ENTIRE DOCUMENT.	1-7
Y	US, A, 4,956,900 (MAIR) 18 SEPTEMBER 1990. SEE ENTIRE DOCUMENT.	8, 15-20

BOX II. OBSERVATIONS WHERE UNITY OF INVENTION WAS LACKING

This ISA found multiple inventions as follows:

- I. Claims 1-14, drawn to an indoor barrier device, classified in class 160, subclass 350.
- II. Claims 15-20, drawn to a threaded plug, classified in class 411, subclass 182.

The inventions listed as Groups I and II do not relate to a single inventive concept under PCT Rule 13.1 because, under PCT Rule 13.2, they lack the same or corresponding special technical features for the following reasons: The combination barrier device as claimed does not require the particulars of the subcombination threaded plug as claimed because the securing means of the barrier device does not need a threaded plug having a pop rivet, and the subcombination threaded plug has separate utility such as for electrical outlet connection.